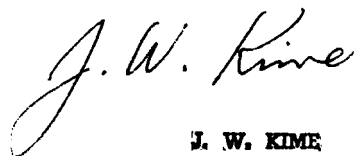


NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 1-87

Subj: Installation of Retroreflective Material on Lifesaving Equipment

1. **PURPOSE.** This Circular is a guide to the installation of retroreflective material on lifesaving equipment in accordance with the 1983 Amendments to the Safety Of Life At Sea Convention of 1974 (hereafter referred to as the 1983 SOLAS Amendments), current federal regulations, and Coast Guard recommendations.
2. **DIRECTIVES AFFECTED.** Navigation and Vessel Inspection Circular No. 4-80 is canceled.
3. **DISCUSSION.** Enclosure (1) is a guide detailing the required and recommended installation of retroreflective material on life saving equipment.
4. **ACTION.** U.S. vessel owners, operators, and U.S. Coast Guard approved lifesaving equipment manufacturers shall ensure that the equipment required to have retroreflective material meets the requirements as detailed in the enclosed guide.



J. W. KIME
Chief, Office of Marine Safety,
Security and Environmental Protection

End: (1) Guide To The Installation Of Retroreflective Material on Lifesaving Appliances

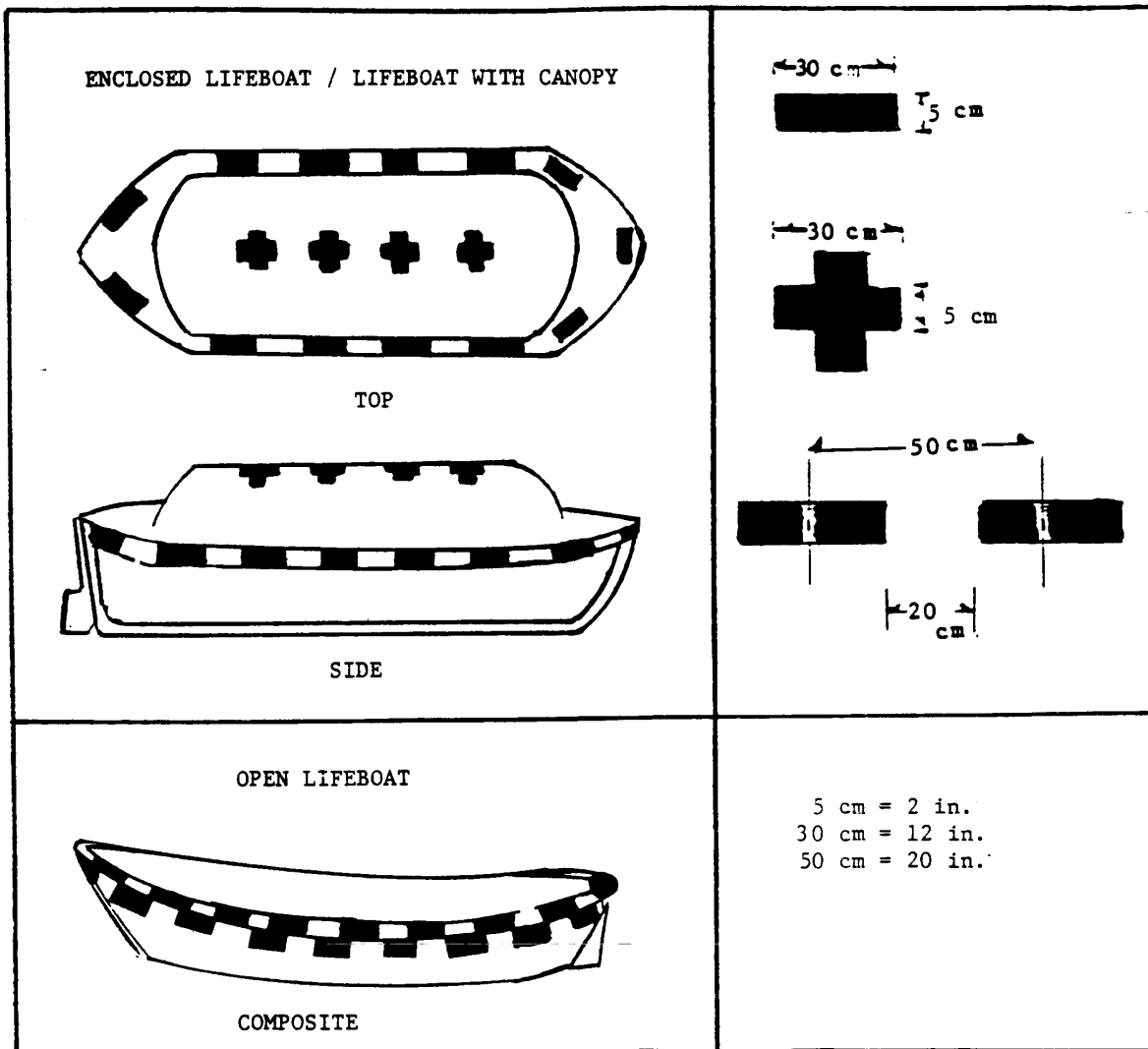
GUIDE TO THE INSTALLATION OF RETROREFLECTIVE MATERIAL ON LIFESAVING APPLIANCES

1. **PURPOSE.** This guide provides information to vessel operators/owners, lifesaving equipment manufacturers and Officers in Charge, Marine Inspection on the installation of retroreflective material on lifesaving equipment.
2. **BACKGROUND.** The 1983 Amendments to the 1974 Safety Of Life At Sea Convention (hereafter referred to as the 1983 SOLAS Amendments) made retroreflective material mandatory for new lifesaving equipment on SOLAS vessels. The requirements apply to lifesaving equipment meeting the 1983 SOLAS Amendments and to the lifesaving equipment on all ships after 1 July 1991. The U.S. Coast Guard believes that retroreflective material is extremely useful in night and twilight search operations and has issued regulations requiring the use of retroreflective material on personal flotation devices and on all new immersion suits, lifeboats, and buoyant apparatus.
3. **DISCUSSION.**
 - a. The requirements concerning retroreflective material found in Regulation 30, Chapter III, of the 1983 SOLAS Amendments are now applicable to lifebuoys (ring buoys), life jackets (life preservers), immersion suits (survival suits), inflatable liferafts, lifeboats, buoyant apparatus, and rescue boats, on vessels as follows:
 - (1) The lifesaving equipment on all new SOLAS ships (i.e. ships constructed after 1 July 1986).
 - (2) The lifesaving equipment on all other SOLAS ships by 1 July 1991.
 - (3) Retroreflective material should be applied to all inflatable liferafts at the next scheduled servicing.
 - b. The owners and manufacturers of all other lifesaving equipment such as work vests, which are not required to meet these SOLAS requirements or existing USCG regulations are strongly encouraged to use this material on their lifesaving equipment.
 - c. Retroreflective material must be approved under Title 46 of the Code of Federal Regulations (CFR), Subpart 164.018. There are two different types of retroreflective material. They are defined in 46 CFR, Subpart 164.018 as follows:
 - (1) Type I - intended for flexible surfaces not continually exposed to the elements.
 - (2) Type II - intended for rigid surfaces continually exposed to the elements.
 - d. Lifesaving equipment, such as lifeboats, rescue boats, life floats, and ring buoys that are exposed to the weather, shall be fitted with Type II retroreflective material. All other devices, such as inflatable liferafts and personal flotation devices, which are not under constant direct exposure to the elements, should use Type I retroreflective material.
 - e. The illustrations on the following pages represent the Coast Guard's interpretation of the requirements for retroreflective tape found in the 1983 SOLAS Amendments.

Illustration (1) to "The Guide On Retroreflective Material"

LIFEBOATS

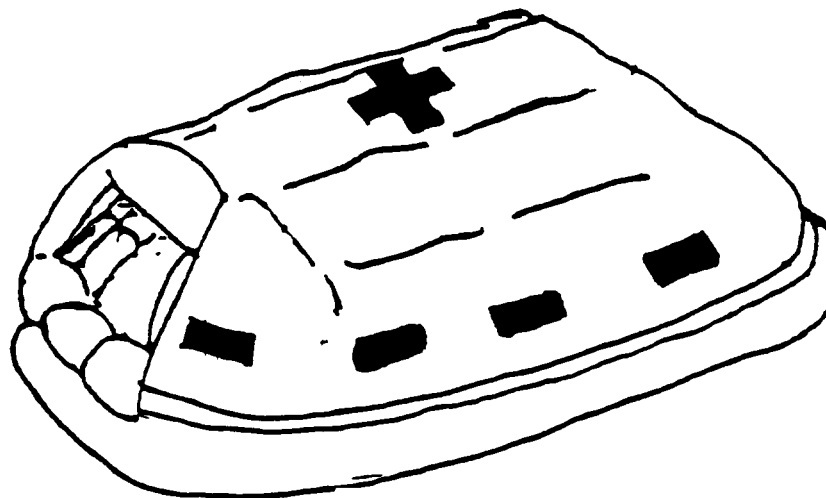
(From IMO Res. A. 274) Retroreflective tapes shall be fitted on the top of the gunwale as well as on the outside of the boat as near the gunwale as possible. The tapes shall be sufficiently wide and long (at least 5 x 30 cm) and shall be spaced at suitable intervals (at least 50 cm). If a canopy is fitted it shall not be allowed to obscure the tapes fitted on the outside of the boat, and the top of the canopy shall be fitted with retroreflective tapes similar to those mentioned above but shaped in the form of a cross and spaced at suitable intervals (at least 50 cm).



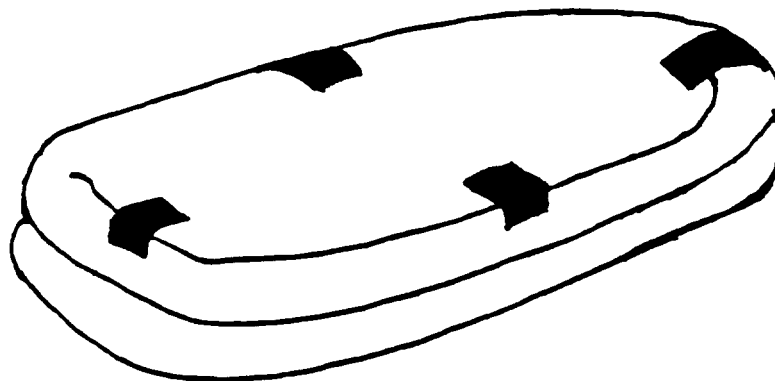
- Required: (1) Lifeboats on all SOLAS ships built after 1 July 1986.
 (2) All lifeboats on each SOLAS ship after 1 July 1991.
- Recommended: (1) All lifeboats.

**Illustration (2) to "The Guide On Retroreflective Material"
INFLATABLE LIFERAFTS**

(From IMO Res. A. 274) Retroreflective tapes shall be fitted around the canopy of the raft at suitable intervals (at least 50 cm) and at a suitable height above the waterline. On inflatable liferafts the tape shall also be fitted on the underside of the floor (four tapes fitted at equal intervals around the outer edges on the bottom of the liferaft). The tapes shall be sufficiently wide and long (at least 5 x 30 cm). A suitable cross shape marking of two such tapes shall be attached on the top of the canopy. On rafts which are not fitted with canopies at least four such tapes shall be fitted along the buoyancy chambers in such a manner that they are visible from both the air and sea. See illustration (1) for details concerning retroreflective tape dimensions and separation.



TOP



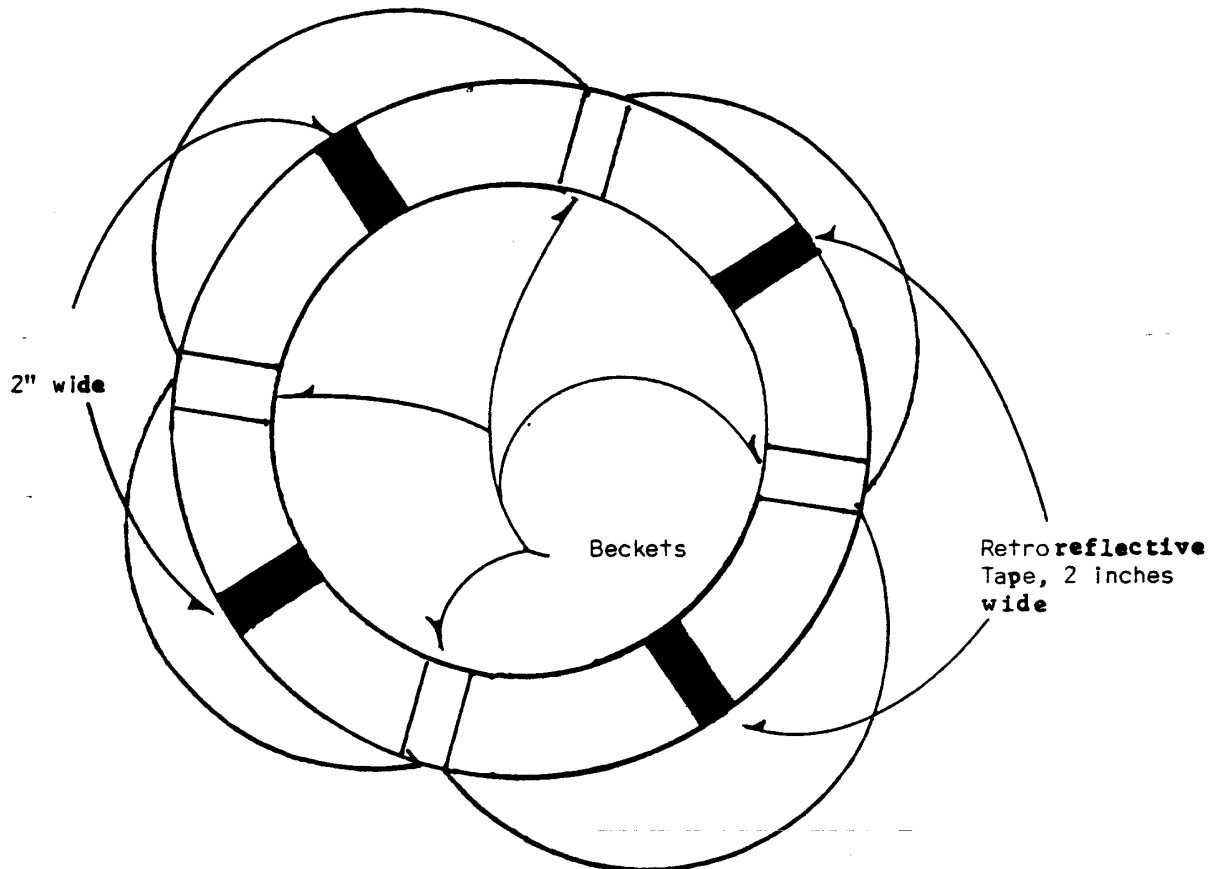
BOTTOM

- Required:**
- (1) Liferafts on all SOLAS ships built after 1 July 1986.
 - (2) All liferafts on each SOLAS ship after 1 July 1991 (Therefore liferafts on SOLAS ships should be equipped with retroreflective material no later than their first annual servicing after 1 July 1990.)

- Recommended:** (1) All liferafts.

Illustration (3) to "The Guide On Retroreflective Material"
RING LIFE BUOYS

(From 1110 Res. A. 274) Retroreflective tape of sufficient width (approximately 5 cm) shall be fitted around or on both sides of the body of the buoy at four evenly spaced points.

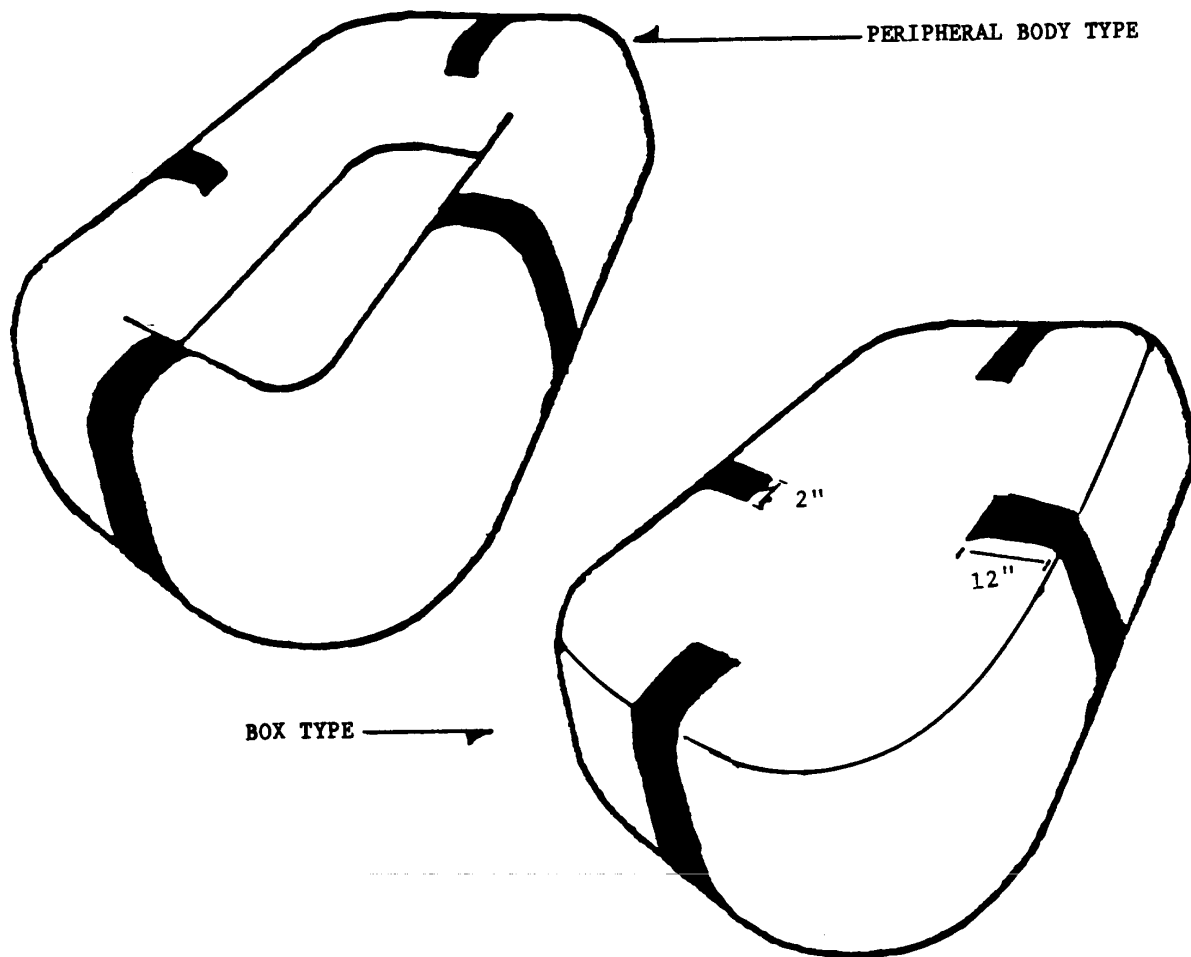


Note: Avoid placing Retroreflective material on beackets

- Required:**
- (1) Ring life buoys on all SOLAS ships built after 1 July 1986.
 - (2) All ring life buoys on each SOLAS ship after 1 July 1991.
- Recommended:** (1) All ring life buoys.

**Illustration (4) to "The Guide On Retroreflective Material"
 BUOYANT APPARATUS AND LIFE FLOATS**

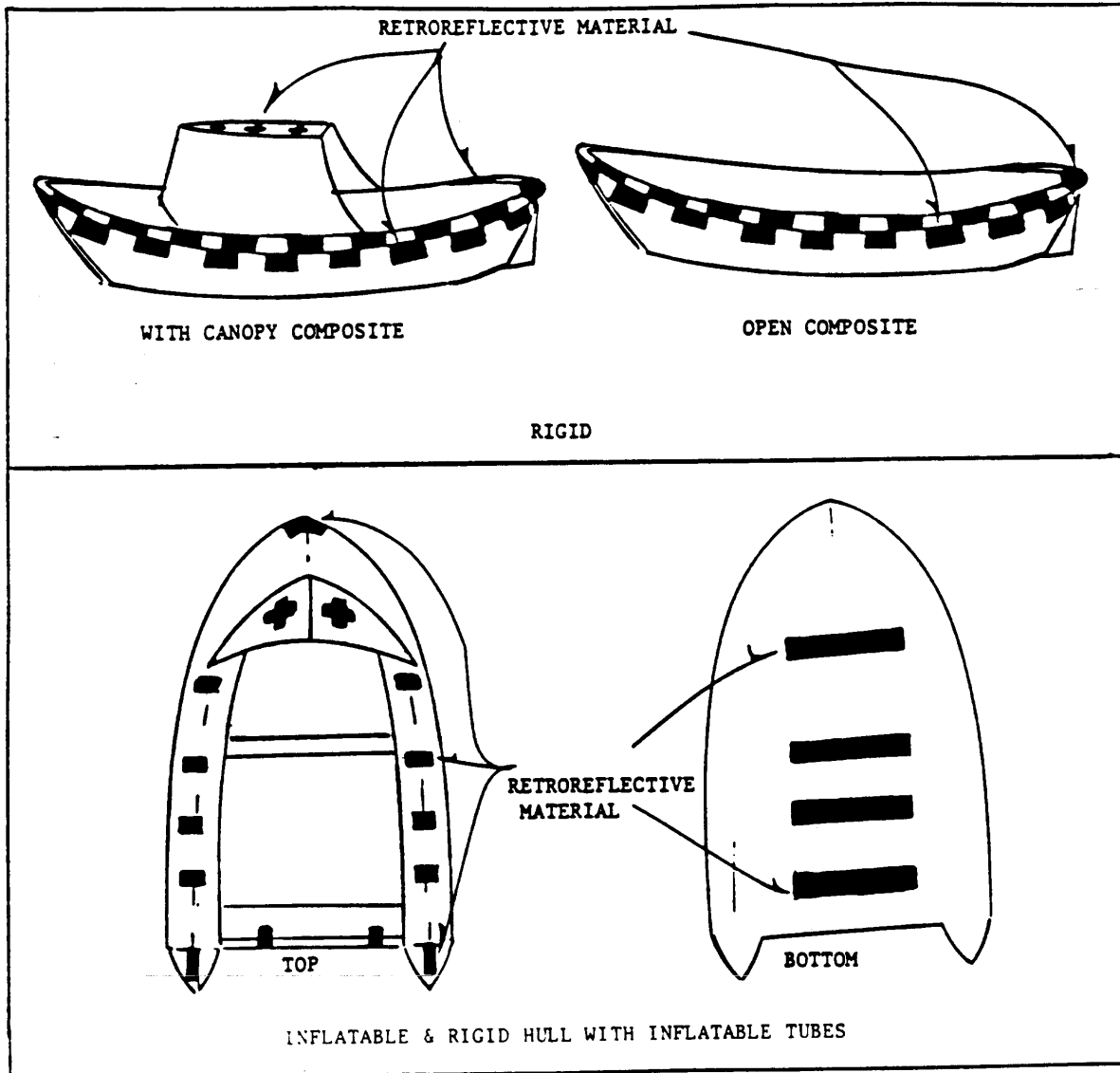
(From 46 CFR 160.010-3[p]). "Each buoyant apparatus must have Type II retroreflective material meeting subpart 164.018 of this chapter on each side and end. The material must be in strips at least 50m (2 in.) wide extending from the top to the bottom over the side or end continuing over the top and bottom surfaces of the apparatus. For peripheral body apparatus, each strip must extend completely over the top and bottom surface of the body. For the box type apparatus the strip must extend at least 300 mm (12 in.) from the edge over the top and bottom surfaces. Each strip must be positioned near the center of the side or end, but so that it is not obscured by any strap."



- Required:**
- (1) All lifefloats and buoyant apparatus built after 20 March 1983.
 - (2) All buoyant apparatus on SOLAS passenger ships after 1 July 1991.
- Recommended:** (1) All lifefloats and buoyant apparatus.

**Illustration (5) to "The Guide On Retroreflective Material"
RESCUE BOATS**

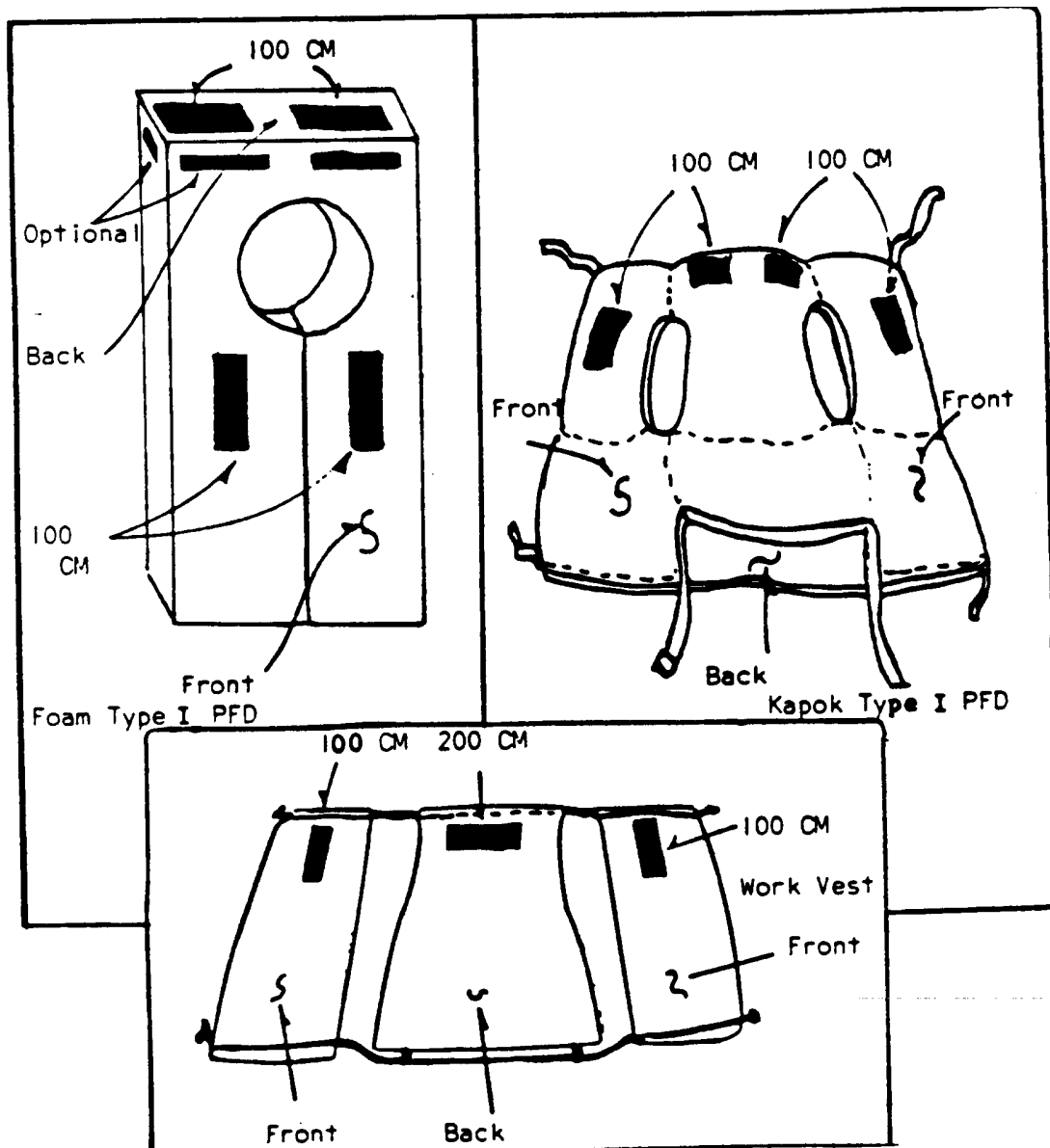
Each rigid rescue boat, inflatable rescue boat, and each rescue boat with a rigid hull or hulls and inflatable buoyancy tubes shall be equipped with retroreflective material as illustrated below (adopted from that section of IMO Res. A.274 concerning lifeboats and liferafts). See illustration (1) for details concerning retroreflective tape dimensions and separation.



- Required:**
- (1) Rescue boats on all SOLAS ships built after 1 July 1986.
 - (2) All rescue boats on each SOLAS ship after 1 July 1991.
- Recommended:** (1) All rescue boats.

**Illustration (6) to "The Guide On Retroreflective Material"
PERSONAL FLOTATION DEVICES**

Life jackets (lifepreservers, Type I PFD) (From Title 46 of the Code of Federal Regulations subparts 25.25-15, 33.35-25, 75.40-35, 94.40-25, 108.514[e][f] 1). "Each lifepreserver, each special purpose water safety buoyant device intended to be worn (Type III PFD), and each buoyant vest (Type II PFD) carried on a vessel after 30 June 1980, must have type I retroreflective material that is approved under subpart 164.018 of this chapter." "Each item required to have retroreflective material must have at least 200 sq. cm. (31 sq. in.) of material attached to its front side, at least 200 sq. cm. of material attached to its back side and if the item is reversible 200 sq. cm. of material on each of its reversible sides. The material, as attached on each side of the item, must be divided equally between the upper quadrants of the side, and the material in each quadrant must be attached as closely as possible to the shoulder area of the item."



Required: (1) All Type I, II, and III PFDs used on commercial vessels.

Recommended: (1) All PFDs including work vests.